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SPRUCE BEETLE POPULATION TREND ON THE PAYETTE NATIONAL FOREST, IDAHO 1990 -- AN UPDATE

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INTRODUCTION

Permanent data collection plots were established in 1986 in seven areas on the Payette National Forest in southwestern Idaho to monitor an ongoing spruce beetle (Dendroctonus rufipennis Kirby) infestation.

Base information collected in 1986 was compared with similar information collected in 1988. Details of the 1988 examination were reported by Mocettini and Cahill, 1989.

In 1990, the data collection plots were again reexamined. Information is reported here.

METHODS

Data collection techniques were identical to those documented earlier (Mocettini and Cahill, 1989). Plots were reexamined in September 1990. All post 1988 spruce beetle attacked trees were identified, and information was recorded. Data collected were summarized, as previously, with INDIDS (Bousfield et al., 1985).

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RESULTS & DISCUSSION

Data concerning spruce mortality from 1986 to 1990 are summarized for each area in Table 1. Beetle activity and accompanying spruce mortality continued in all areas with spruce mortality over the period ranging from 60 to 78 percent (spruce $\geq$ 5 inches diameter). Mortality in spruce $\geq$ 12 inches diameter ranged from 77 to 95 percent.

From 1988 through 1990, the largest amount of spruce mortality (in the past 2 years) occurred in Hard Creek and Wilson Creek areas with 66 percent and 62 percent mortality, respectively. Total mortality for the outbreak in the 2 areas is 75 percent and 78 percent, respectively.

Marshall Lake area experienced mortality of over 40 percent the last 2 years. Total mortality is 65 percent for the outbreak period.

Upper Fisher Creek, Jackson Creek, and Little French Creek had 15 to 16 percent mortality since 1988. Total mortality in these drainages ranges from 60 to 73 percent for the outbreak period.

Vance Creek had the lowest amount of spruce mortality with only 5 percent of green spruce dying in the past 2 years. Total mortality is 68 percent during the current outbreak.

The average diameter of surviving spruce continued to decrease or remained static in all areas (Table 2). Spruce beetle will continue to kill spruce trees in all surveyed areas, but the rate of infestation will decrease as the available host decreases. With the exception of two areas, Vance Creek and Hard Creek, low Engelmann spruce beetle activity is expected due to the small remaining diameters and the trend of decreasing activity. While large d.b.h. trees remain at Vance Creek, low activity is expected because of the recent (last 2 years) low beetle activity which indicates these large trees are resistant to attack. The large average d.b.h. of green spruce and the high beetle activities in Hard Creek suggest significant continued beetle activity.

Mocettini and Cahill (1989) predicted that Hard Creek and Wilson Creek had the highest potential for spruce beetle activity due to the large average diameter of remaining green spruce. Increased beetle activity in these areas seems to coincide with cessation of salvage activity in 1988. Since that time, over 60 percent of the spruce has been killed by spruce beetle confirming that prediction.

SUMMARY

Spruce beetle has killed 60 to 78 percent of spruce $\geq$ 5 inches d.b.h. and 77 to 95 percent of all spruce $\geq$ 12 inches d.b.h. The d.b.h. of remaining spruce continues to decrease or remain static. I expect continued mortality, but at low rates, in most areas because most of the susceptible host has been killed.

LITERATURE CITED

Bousfield, W.; Eder, R.; and Bennett, D. 1985. User guide and documentation for insect and disease damage survey (INDIDS). USDA Forest Service, State and Private Forestry Report No. 85-19. 19pp.

Mocettini, P.; and Cahill, D. 1989. Evaluation of spruce beetle population trends on the Payette National Forest, Idaho 1985 - 1988. USDA Forest Service, Forest Pest Management, Region 4, Boise, Idaho. 12pp.

Table 1.---Cumulative spruce mortality of trees > 5" diameter (Cumulative spruce mortality of trees > 12" diameter).

Location	1986	1988	1990
District 4			
Upper Fisher Creek	2% (1%)	57% (82%)	73% (89%)
Jackson Creek	8% (12%)	44% (64%)	60% (80%)
Wilson Creek	0% (0%)	16% (11%)	78% (95%)
District 3			
Vance Creek	15% (17%)	63% (71%)	68% (77%)
Hard Creek	0% (0%)	9% (11%)	75% (80%)
Little French Creek	0% (0%)	45% (65%)	62% (81%)
BLM			
Marshall Lake	6% (11%)	23% (44%)	65% (83%)

Table 2.---Average diameter of live spruce trees (in inches).

Location	1986	1988	1990
District 4			
Upper Fisher Creek	13.0	9.4	9.6
Jackson Creek	15.0	12.0	10.2
Wilson Creek	13.2	13.8	9.4
District 3			
Vance Creek	21.5	15.7	15.4
Hard Creek	20.9	19.8	13.4
Little French Creek	18.6	11.7	10.7
BLM			
Marshall Lake	14.9	12.1	11.5